

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
4 November 2004 (04.11.2004)

PCT

(10) International Publication Number
WO 2004/094287 A3

(51) International Patent Classification⁷: **B66B 11/08, 7/10**

(21) International Application Number:
PCT/US2004/012420

(22) International Filing Date: 22 April 2004 (22.04.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
PCT/US03/12266 22 April 2003 (22.04.2003) US

(71) Applicant (for all designated States except US): **OTIS ELEVATOR COMPANY** [US/US]; Ten Farm Springs, Farmington, CO 06032 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **SIEWERT, Bryan, Robert** [US/US]; 37 Overlook Drive, Westbrook, CT

06498 (US). **THOMPSON, Mark, S.** [US/US]; 151 Old Kent Road North, Tolland, CT 06084 (US). **HOLLOWELL, Richard, L.** [US/US]; 36 Richardson Drive, Hebron, CT 06248 (US).

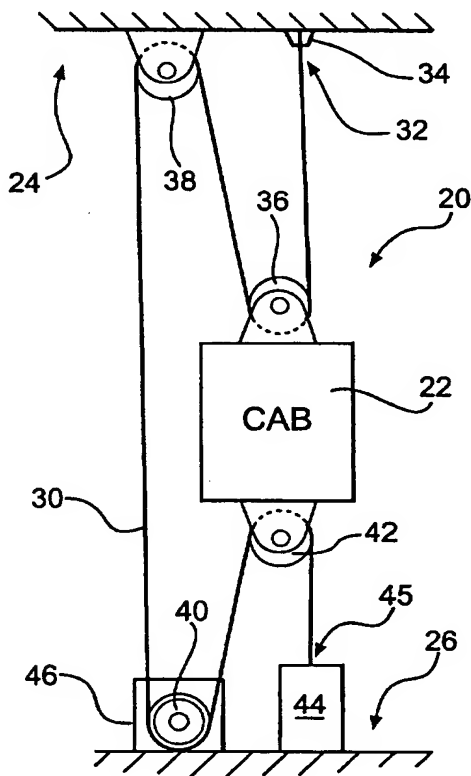
(74) Agent: **O'BRIEN, Sean, W.**; Intellectual Property Department, Otis Elevator Company, Ten Farm Springs, Farmington, CT 06032 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH,

[Continued on next page]

(54) Title: **ELEVATOR SYSTEM WITHOUT A MOVING COUNTERWEIGHT**



(57) Abstract: An elevator system (20) includes a cab (22) supported for movement within a hoistway. A plurality of cab-supported sheaves (36, 42) moves with the cab through the hoistway. A first hoistway sheave (38) is located near a first end of the hoistway, and a second hoistway sheave (40) is located near a second end of the hoistway. A load bearing member (30) is provided, which (i) extends from near the first end of the hoistway toward the cab, where the load bearing member is redirected by one of the plurality of cab-supported sheaves toward the first end of the hoistway, (ii) at least partially wraps around each of the first hoistway sheave and the second hoistway sheave, and (iii) extends from near the second end of the hoistway toward the cab, where the load bearing member is redirected by another of the plurality of cab-supported sheaves toward the second end of the hoistway. A tension device (44) maintains tension in the load bearing member.



GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

— before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

(88) Date of publication of the international search report:

3 March 2005

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US04/12420

A. CLASSIFICATION OF SUBJECT MATTER IPC(7) : B66B 11/08, 7/10 US CL : 187/264, 266, 412 According to International Patent Classification (IPC) or to both national classification and IPC				
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) U.S. : 187/264, 266, 412, 254 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)				
C. DOCUMENTS CONSIDERED TO BE RELEVANT				
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.		
A	US 3,101,130 A (Bianca) 20 August 1963 (20.08.1963), Figures 1-5.	1-10		
A	US 5,526,901 A (Salmon) 18 June 1996 (18.06.1996), Figures 1-2.	1-10		
A	US 5,509,503 (Salmon) 23 April 1996 (23.04.1996), Figures 1-6.	1		
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.				
<table border="0"> <tr> <td> * Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed </td> <td> "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family </td> </tr> </table>			* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family
* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family			
Date of the actual completion of the international search 30 September 2004 (30.09.2004)		Date of mailing of the international search report 14 JAN 2005		
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (703) 305-3230		Authorized officer Eileen D. Lillis Telephone No. 703-308-1113		